IDEM *Office of Air Quality* *December 2008*

(800) 451-6027 *www.in.gov/idem/4654.htm*

2008 Ozone Season Summary Report

Purpose

This ozone season summary provides an overview of ozone levels from the 2008 monitoring season and ozone trends over the last nine years. Prior to 2008, the Indiana Department of Environmental Management (IDEM) monitored ozone levels under the 8-hour ozone standard that was established in July 1997 by the U.S. Environmental Protection Agency (U.S. EPA). The 1997 8-hour ozone standard was 0.08 parts per million (ppm). Values below 0.085 ppm meet the standard, values equal to or greater than 0.085 ppm exceed the standard. On March 12, 2008, the U.S. EPA significantly strengthened the 8-hour ozone standard to a level of 0.075 ppm in order to be more protective of public health. Starting in 2008, an area violates the standard when the *design value,* which is the three-year average of the fourth highest value for each ozone season, is equal to or greater than 0.076 ppm.

Indiana monitors ozone in areas where levels are expected to be higher because of population density, motor vehicle and industrial activities. IDEM and local air agencies collected and reported data from 40 ozone monitors across Indiana in 2008. In December 2007, the Indianapolis-Mann Road ozone monitor was discontinued. An ozone monitor will be added to the Indianapolis-Washington Park site in 2009.

Ozone Designations and Redesignations

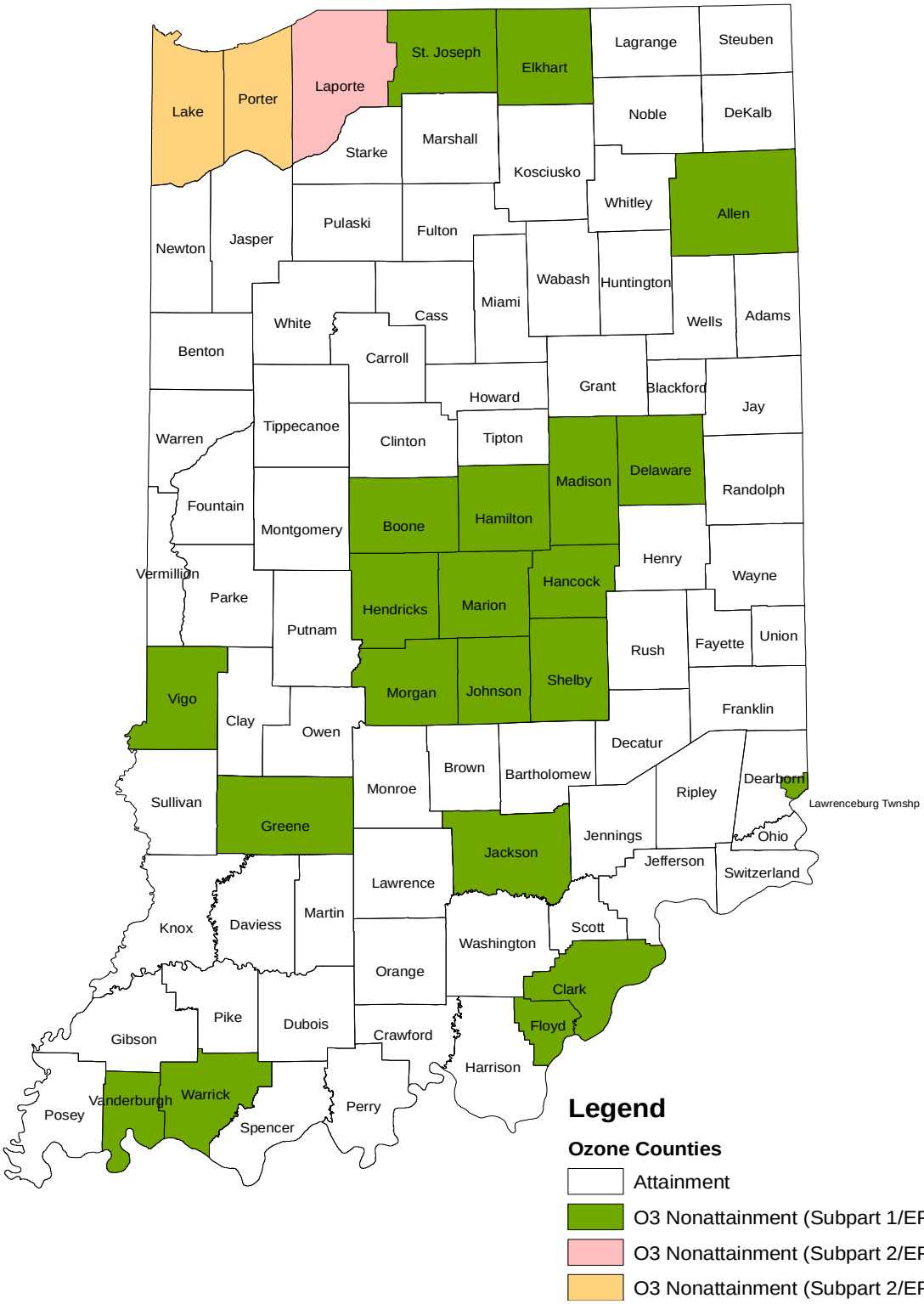
On April 15, 2004, the U.S. EPA designated areas under the new 8-hour ozone health standard of 0.08 ppm and classified them as attainment, nonattainment or unclassifiable based on data collected from 2001-2003. In its initial announcement, 23 counties and one township in Indiana were identified as being in violation of the new 8-hour standard. At the close of the 2007 ozone season, only one monitor recorded a three-year design value above the standard. At the close of the 2008 ozone season, all 40 ozone monitors had a three-year design value which met the standard.

Lake and Porter counties are still considered nonattainment under the 1997 8-hour ozone standard. At the close of the 2008 ozone season, the area once again met the standard and IDEM will be submitting a revised redesignation request to U.S. EPA for the area in early 2009. Lawrenceburg Township, located in Dearborn County, is the only other area still designated as nonattainment for the 1997 8-hour ozone standard. Lawrenceburg Township is part of the Cincinnati nonattainment area and therefore, is not eligible to be redesignated to attainment until the Cincinnati area is redesignated. At the end of the 2008 ozone season, Cincinnati had two monitors with values of 0.085 ppm or greater. There are no ozone monitors in Dearborn County. In 2007, IDEM submitted an attainment demonstration to U.S. EPA for Lawrenceburg Township indicating the area will attain the standard by 2009.

On March 12, 2009, state recommendations to the U.S. EPA for attainment, nonattainment, and unclassifiable areas are due for the revised 8-hour standard of 0.075 ppm. For more information regarding the ozone designation process, or Indiana's redesignation petitions and maintenance plans, visit www.in.gov/idem/4654.htm or contact Sarah Raymond of the Office of Air Quality at (800) 451-6027 or (317) 232-8449.

2004 8-Hour Ozone Designations

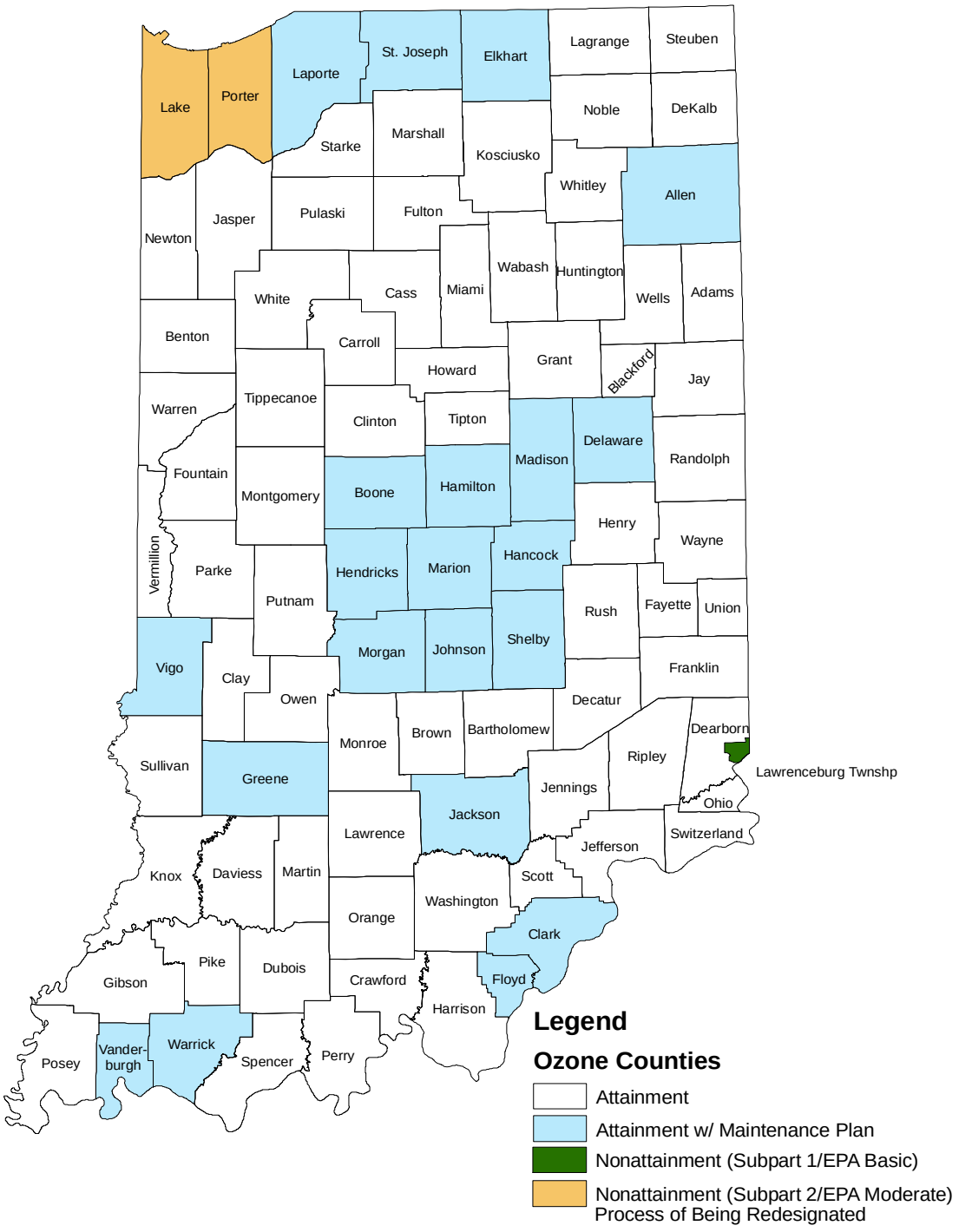
The map below shows the nonattainment designations that U.S. EPA made in April 2004. Twenty-three full counties and one partial county, Lawrenceburg Township in Dearborn County, were designated as nonattainment of the 8-hour ozone standard. That means those areas had a three-year (2001-2003) design value for ozone which was equal to or greater than 0.085 parts per million.



2008 8-Hour Ozone Status

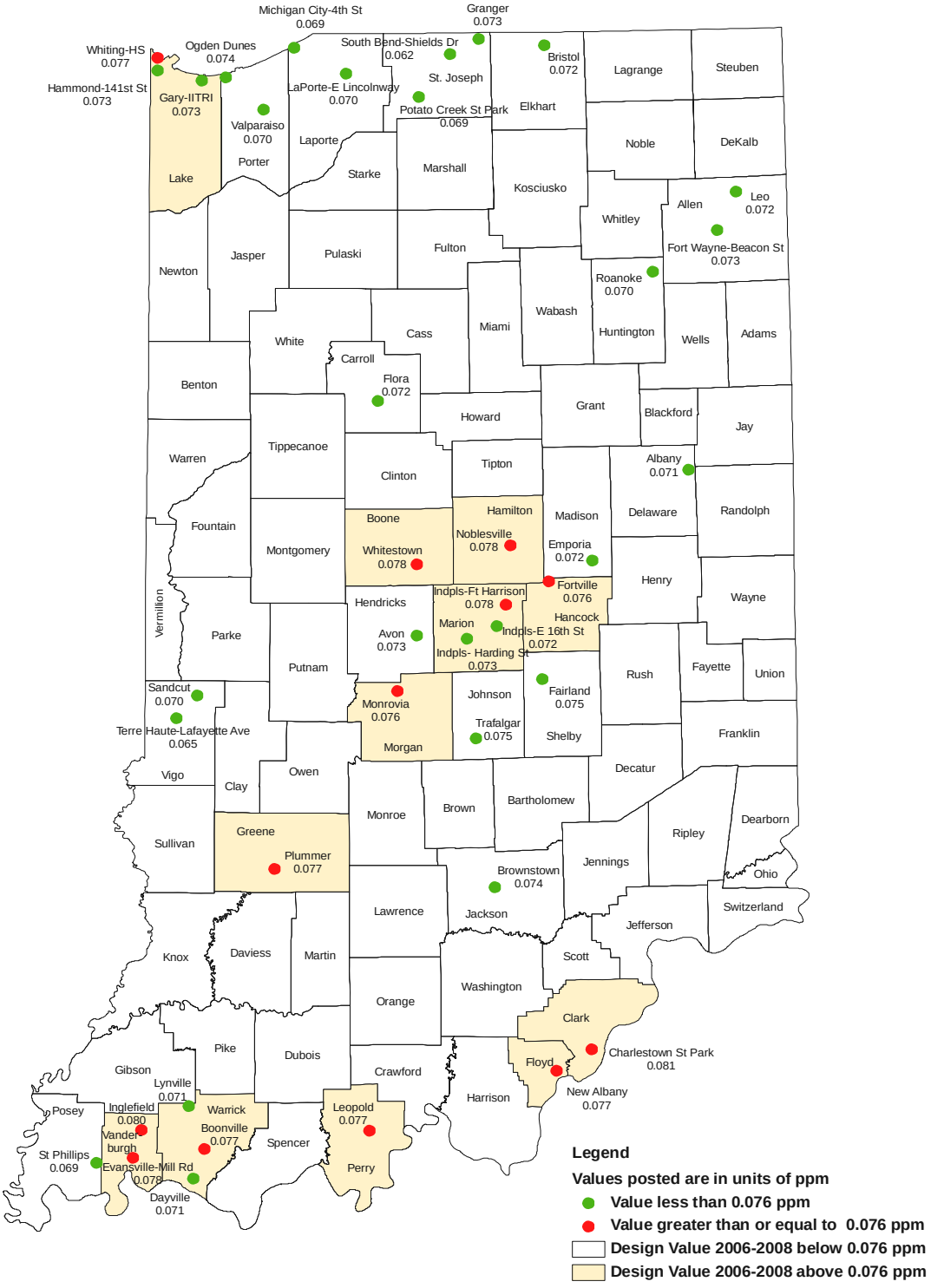
The map shows the designation status of the counties in Indiana for the year 2008 based on the 1997 8-hour standard (0.08 ppm). Lawrenceburg Township in Dearborn County is part of the Cincinnati nonattainment area and will not be eligible for redesignation until the Cincinnati area becomes eligible. Lake and Porter counties redesignation request is pending approval due to unexpected elevated values in the area during the 2007 ozone season.

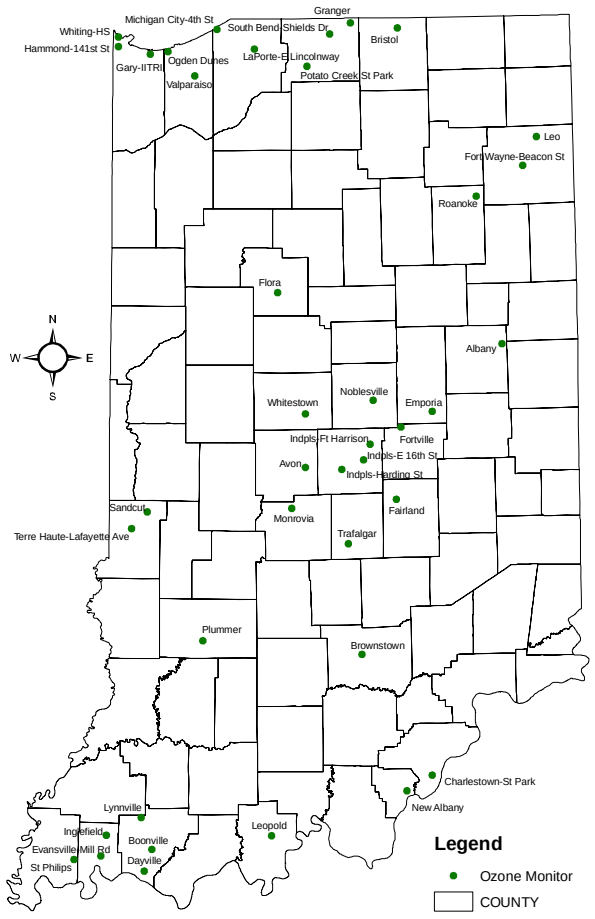
Ozone Nonattainment Areas



2008– 8-Hour Ozone Status

On March 12, 2008, the U.S. EPA revised the 8-hour ozone standard to a level of 0.075 ppm. The map shows the current designation status compared to the new standard for the counties in Indiana based on 2006-2008 monitoring data. Designation recommendations are due March 12, 2009 and will mostly likely be finalized in 2010 using 2007-2009 monitoring data.





Ozone Monitoring

U.S. EPA provides guidelines for the placement of ambient air quality monitors. Ozone monitors are placed based on the population density and manufacturing levels in an area since ozone levels are expected to be higher in those areas. In 2008, there were 40 ozone monitors located throughout the state from which IDEM and local air agencies collected data.

Ozone levels are monitored 24 hours per day and rolling 8-hour averages are calculated. The highest 8-hour average is what is reported for the day.

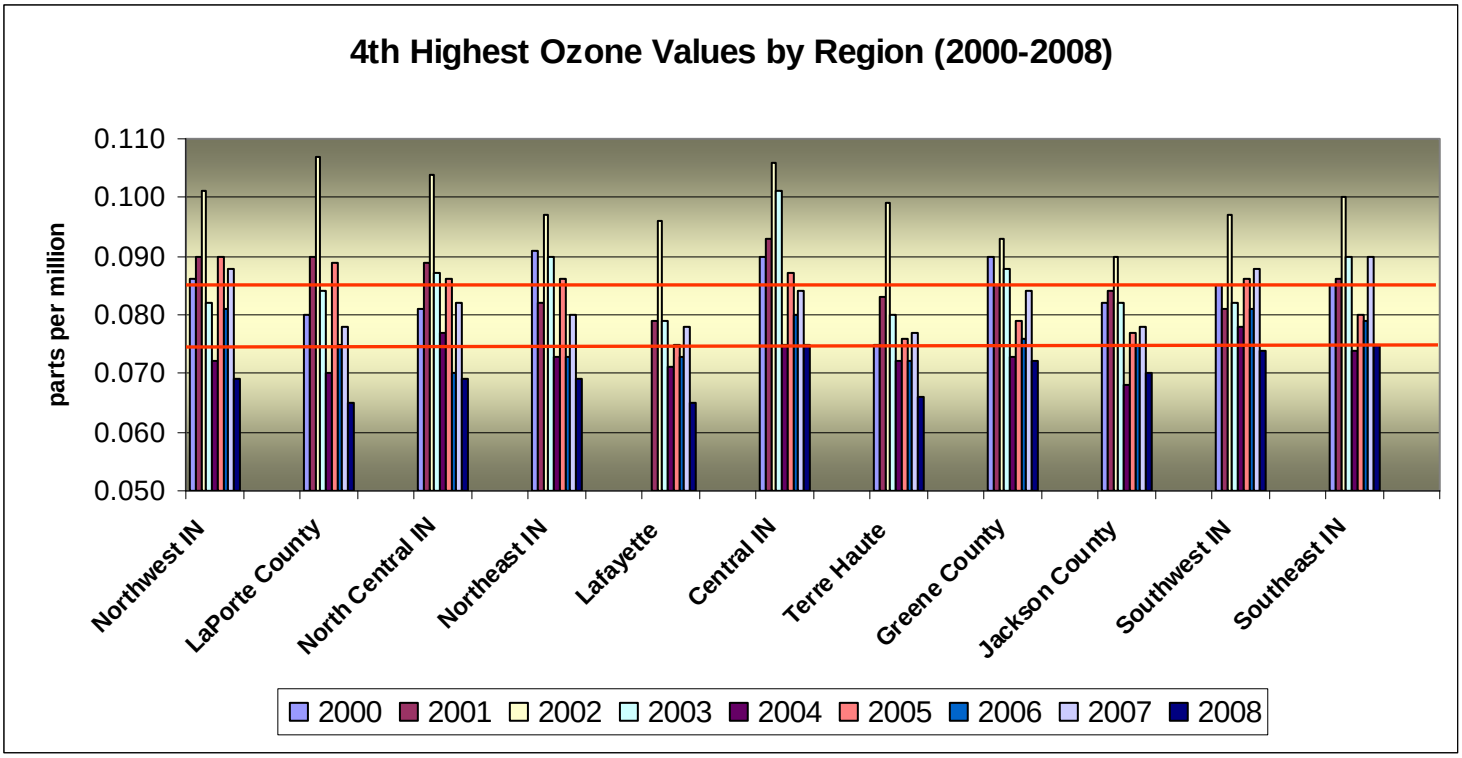
A monitor's design value is calculated at the end of the ozone season using the fourth highest value from the current year and the preceding two years to get a three-year average. This is the design value that U.S. EPA uses to determine if an area is above or below the standard.

For example, the 2006-2008 design value shown on the table below is the average of the 4th high values for 2006, 2007, and 2008. Design values have been calculated for each monitor in the state.

At the close of the 2008 ozone season, no ozone monitors across Indiana recorded a 4th high value equal to or above the 1997 8-hour standard and no monitors had a three-year design value that exceeded the 1997 8-hour ozone standard. No monitors in areas that have a maintenance plan had an exceedance or violation of the 1997 8-hour ozone standard.

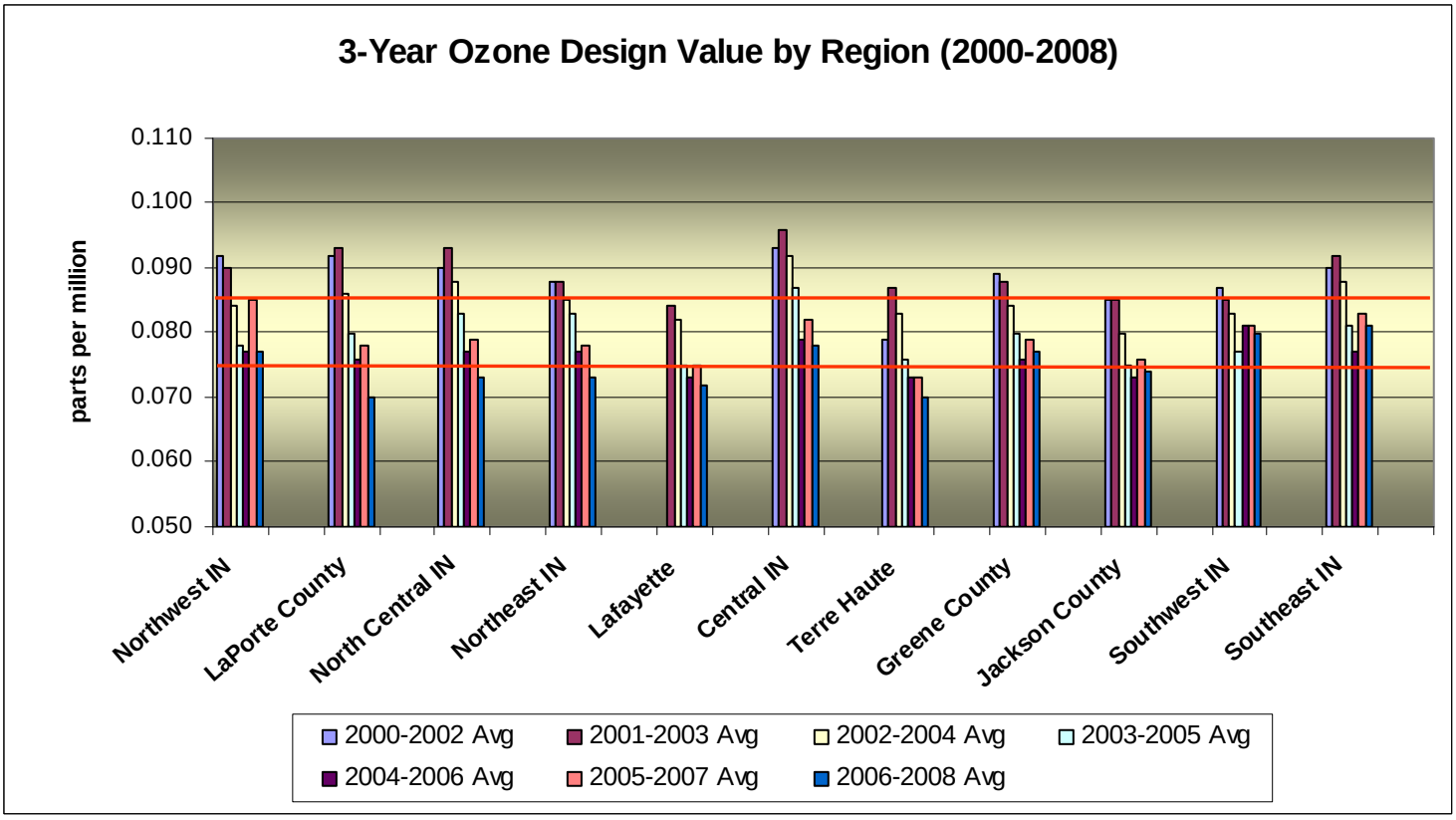
2006-2008 Fourth High Ozone Values and 2006-2008 Design Values (ppm)

County	Site	2006 4th High	2007 4th High	2008 4th High	2006-2008 Design Value	County	Site	2006 4th High	2007 4th High	2008 4th High	2006-2008 Design Value
Allen	Leo	0.073	0.077	0.066	0.072	Marion	Mann Rd.	0.074	0.080	Site Discontinued December 31, 2007	
Allen	Ft. Wayne	0.071	0.080	0.069	0.073	Marion	Ft. Harrison	0.076	0.083	0.075	0.078
Boone	Whitestown	0.080	0.083	0.073	0.078	Marion	Harding St.	0.076	0.076	0.067	0.073
Carroll	Flora	0.073	0.078	0.065	0.072	Marion	Naval Warfare	0.072	0.080	0.066	0.072
Clark	Charlestown	0.079	0.090	0.075	0.081	Morgan	Monrovia	0.077	0.084	0.069	0.076
Delaware	Albany	0.072	0.079	0.062	0.071	Perry	Leopold	0.079	0.080	0.073	0.077
Elkhart	Bristol	0.067	0.082	0.068	0.072	Porter	Odgen Dunes	0.070	0.084	0.069	0.074
Floyd	New Albany	0.076	0.082	0.075	0.077	Porter	Valparaiso	0.071	0.080	0.061	0.070
Greene	Plummer	0.076	0.084	0.072	0.077	Posey	St. Phillips	0.058	0.080	0.069	0.069
Hamilton	Noblesville	0.077	0.084	0.073	0.078	St. Joseph	Potato Creek	0.069	0.075	0.063	0.069
Hancock	Fortville	0.075	0.081	0.074	0.076	St. Joseph	Granger	0.070	0.082	0.069	0.073
Hendricks	Avon	0.073	0.079	0.068	0.073	St. Joseph	South Bend	0.063	0.067	0.058	0.062
Huntington	Roanoke	0.072	0.078	0.060	0.070	Shelby	Fairland	0.073	0.082	0.070	0.075
Jackson	Brownstown	0.075	0.078	0.070	0.074	Vanderburgh	Evansville	0.075	0.085	0.074	0.078
Johnson	Trafalgar	0.078	0.080	0.069	0.075	Vanderburgh	Inglefield	0.081	0.088	0.072	0.080
Lake	Gary IITRI	0.073	0.085	0.062	0.073	Vigo	Terre Haute	0.060	0.077	0.059	0.065
Lake	Whiting	0.081	0.088	0.062	0.077	Vigo	Sandcut	0.072	0.073	0.066	0.070
Lake	Hammond	0.075	0.077	0.068	0.073	Warrick	Boonville	0.078	0.083	0.071	0.077
LaPorte	Michigan City	0.075	0.073	0.059	0.069	Warrick	Lynnville	0.070	0.080	0.064	0.071
LaPorte	LaPorte	0.069	0.078	0.065	0.070	Warrick	Dayville	0.078	0.076	0.060	0.071
Madison	Emporia	0.073	0.078	0.065	0.072	**Prior to 2008, red numbers are equal to or greater than 0.085 ppm. In 2008, red numbers are equal to or greater than 0.076 ppm.**					



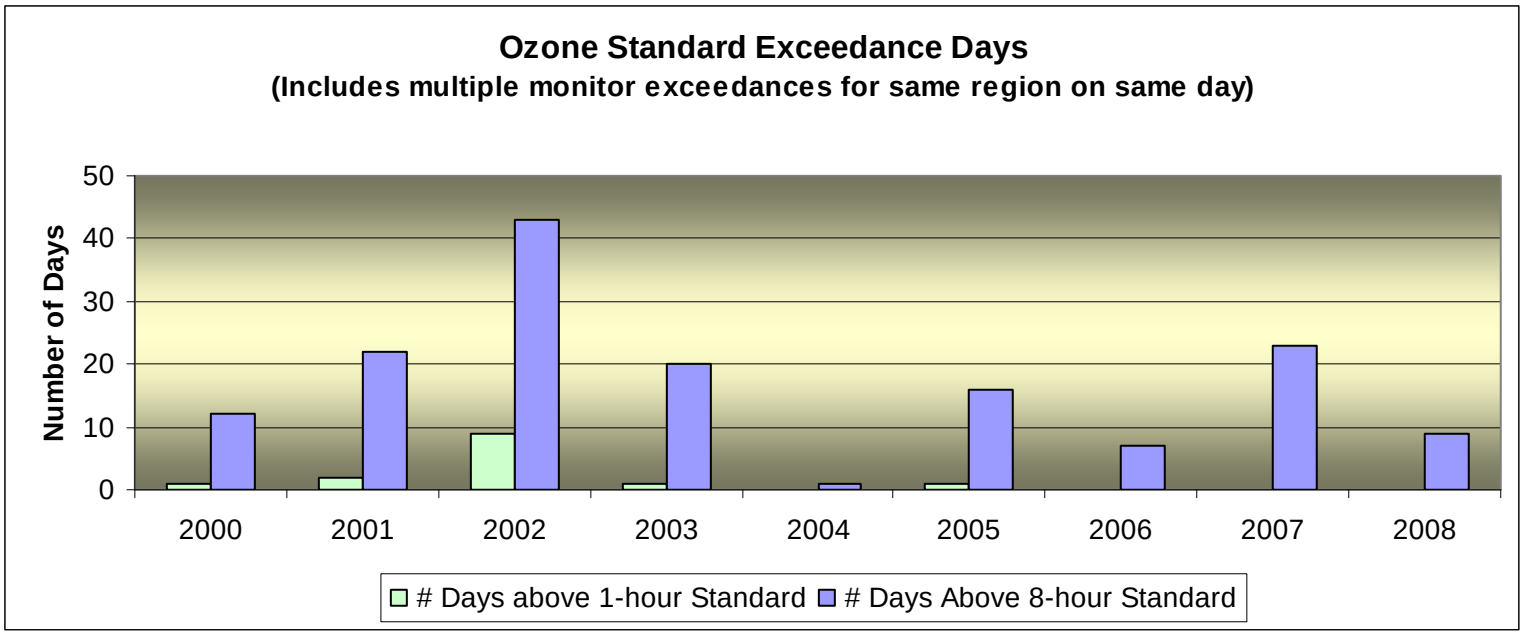
An Exceedance versus a Violation of the Standard

An exceedance occurs when an 8-hour average value is measured above the standard. A violation occurs when the three-year average of the fourth highest value for the ozone season exceeds the standard. A monitor can exceed the standard without being in violation.



Ozone Standard Exceedance Days

The 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. However, for the sake of information, the 1-hour standard is still included in this graph. There were no exceedances of the 1-hour standard in 2006, 2007, or 2008. Days above the 8-hour standard prior to 2008 are equal to or greater than 0.085 ppm. Days above the 8-hour standard in 2008 are equal to or greater than 0.076 ppm.



Total Days of 8-Hour Ozone Exceedances by Monitor 2000-2008

County	Location	00	01	02	03	04	05	06	07	08	County	Location	00	01	02	03	04	05	06	07	08
Allen	Leo	4	2	13	4	0	8	0	0	0	Marion	Fort Harrison	3	6	12	5	0	1	0	1	2
Allen	Fort Wayne	1	0	14	3	0	0	0	1	0	Marion	Harding Street	3	3	12	2	0	1	0	0	0
Boone	Whitestown	2	3	12	5	1	1	1	1	0	Marion	Mann Road	2	0	11	2	0	0	0	1	
Carroll	Flora		1	10	2	0	0	0	1	0	Marion	NAC	2	2	15	3	0	0	0	0	0
Clark	Charlestown	4	4	15	4	0	3	3	8	3	Morgan	Monrovia	5	2	13	2	0	0	0	2	1
Delaware	Albany		3	11	5	0	2	0	2	0	Perry	Leopold					0	4	0	3	2
Elkhart	Bristol			18	4	0	5	0	1	0	Porter	Ogden Dunes	4	4	12	1	0	7	0	3	1
Floyd	New Albany	0	0	11	4	0	2	1	3	3	Porter	Valparaiso	3	0	16	2	0	2	0	0	0
Greene	Plummer	4	5	14	4	0	0	0	3	0	Posey	St. Phillips	5	0	13	1	0	1	0	0	1
Hamilton	Noblesville	4	4	19	5	0	4	1	2	3	Shelby	Fairland	4	6	13	4	0	0	0	1	0
Hancock	Fortville	4	8	18	6	0	1	0	1	2	St. Joseph	Granger	1	6	22	5	1	6	0	2	0
Hendricks	Avon	4	3	10	2	0	0	0	0	0	St. Joseph	Potato Creek	1	2	16	1	0	0	0	0	0
Huntington	Roanoke	4	1	10	3	0	0	0	0	0	St. Joseph	South Bend	3	3	16	1	1	2	0	0	0
Jackson	Brownstown	3	1	8	0	0	0	0	0	1	Vanderburgh	Evansville	1	0	16	2	0	1	1	4	2
Johnson	Trafalgar	3	2	13	2	0	1	0	2	1	Vanderburgh	Inglefield	0	0	5	1	0	0	2	8	1
Lake	Gary IITRI	1	3	7	0	0	7	0	4	1	Vigo	Sandcut		2	9	2	0	1	0	0	0
Lake	Hammond	4	8	18	2	0	5	0	1	0	Vigo	Terre Haute	1	2	2	0	0	0	0	1	0
Lake	Whiting					0	4	2	5	0	Warrick	Boonville	0	1	12	2	0	2	2	1	0
LaPorte	LaPorte	3	0	15	3	0	4	0	1	0	Warrick	Dayville						0	0	0	0
LaPorte	Michigan City	3	8	16	2	0	3	0	0	0	Warrick	Lynnville	0	1	11	2	0	0	0	0	1
Madison	Emporia	1	5	17	8	0	1	0	1	0	Warrick	Yankeetown	0	1	17	2	0				

Indicates monitor was not in operation that year.

Days above the 8-hour standard prior to 2008 are equal to or greater than 0.085 ppm. In 2008, days above the 8-hour standard are equal to or greater than 0.076 ppm.

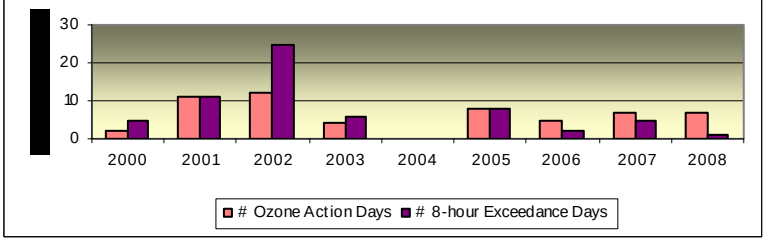
Number of Ozone Action Days 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Northwest Indiana	2	11	12	4	0	8	5	7	7
North Central Indiana	3	9	15	9	0	13	4	2	6
Northeast Indiana	5	6	14	6	0	11	4	2	6
Central Indiana	2	7	12	7	0	9	3	13	9
West Central Indiana	2	0	0	0	0	6	2	7	2
Southwest Indiana	1	3	11	3	0	8	9	21	9
Southeast Indiana	6	5	12	5	1	8	8	25	12

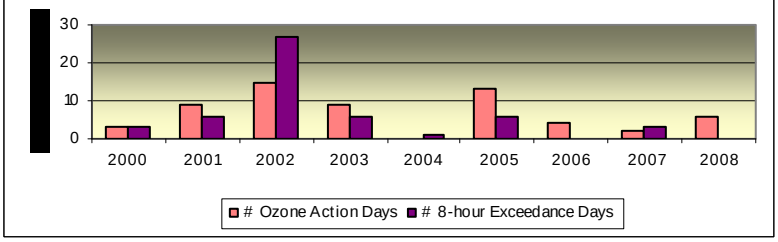
Number of 8-Hour Exceedance Days 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Northwest Indiana	5	11	25	6	0	8	2	5	1
North Central Indiana	3	6	27	6	1	6	0	3	0
Northeast Indiana	4	3	14	4	0	8	0	1	0
Central Indiana	5	11	26	12	1	5	2	6	5
West Central Indiana	1	2	14	3	0	1	0	2	0
Southwest Indiana	8	6	21	6	0	4	2	12	5
Southeast Indiana	5	5	21	5	0	3	3	9	4

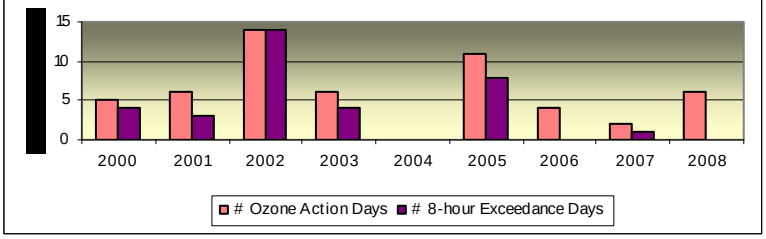
Northwest Indiana
Ozone Action Days vs 8-Hour Exceedance Days



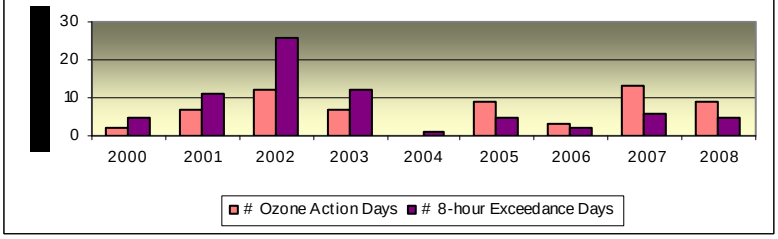
North Central Indiana
Ozone Action Days vs 8-Hour Exceedance Days



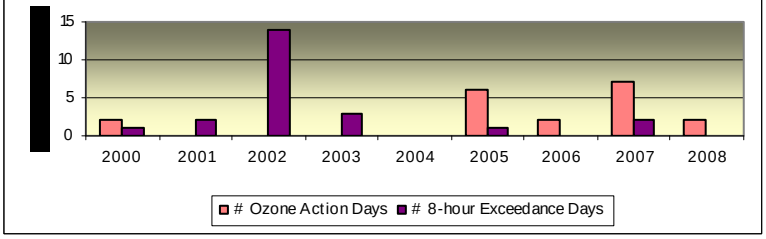
Northeast Indiana
Ozone Action Days vs 8-Hour Exceedance Days



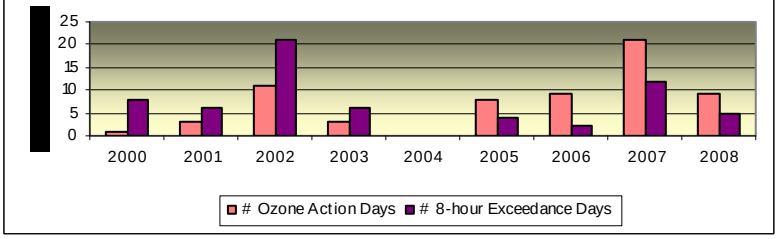
Central Indiana
Ozone Action Days vs 8-Hour Exceedance Days



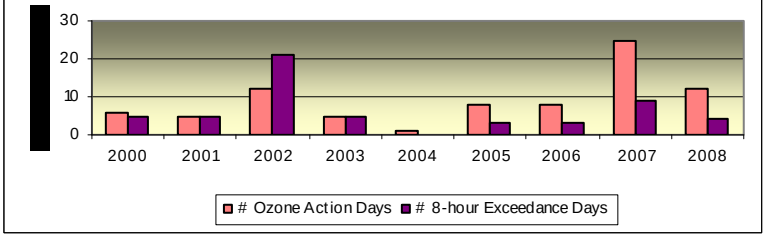
West Central Indiana
Ozone Action Days vs 8-Hour Exceedance Days



Southwest Indiana
Ozone Action Days vs 8-Hour Exceedance Days



Southeast Indiana
Ozone Action Days vs 8-Hour Exceedance Days



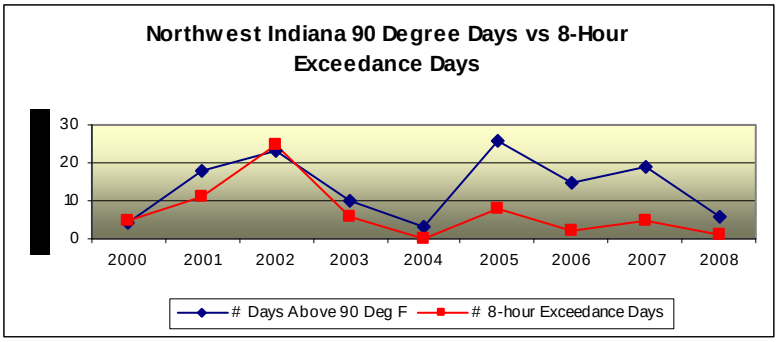
Ozone Monitors by Area of the State		
Area	**Counties**	
Northwest	Lake	LaPorte Porter
North Central	Elkhart	St. Joseph
Northeast	Allen	Huntington
Central	Boone Delaware Hamilton Hancock Hendricks	Johnson Madison Marion Morgan Shelby
West Central	Carroll	Vigo
Southwest	Greene Perry Posey	Vanderburgh Warrick
Southeast	Clark	Jackson Floyd

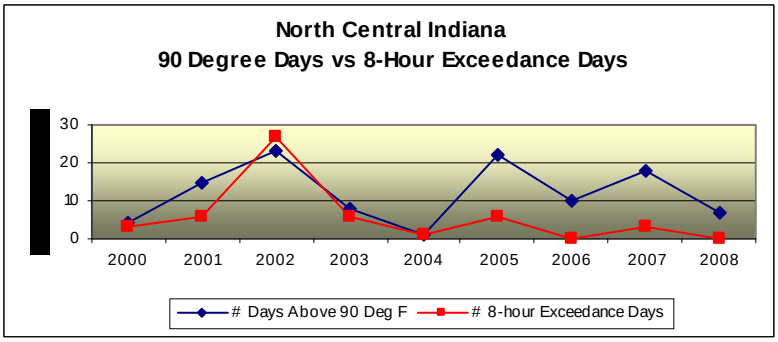
Number of 90 Degree Days 2000-2008

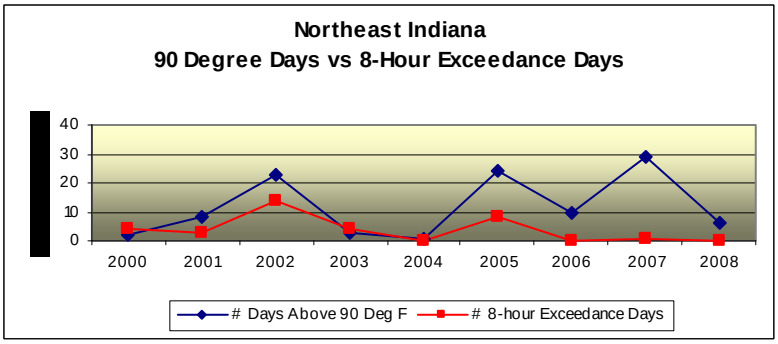
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Northwest Indiana	4	18	23	10	3	26	15	19	6
North Central Indiana	4	15	23	8	1	22	10	18	7
Northeast Indiana	2	8	23	3	1	24	10	29	6
Central Indiana	5	11	36	6	0	21	10	35	6
West Central Indiana	5	11	36	6	0	58	42	28	7
Southwest Indiana	22	30	56	23	9	46	32	58	36
Southeast Indiana	14	21	40	15	19	50	31	64	48

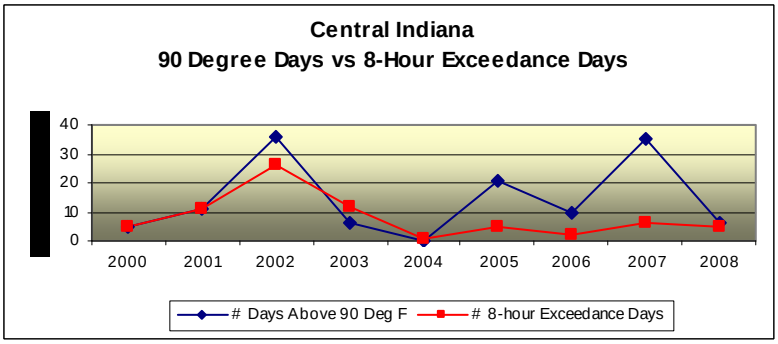
Number of 8-Hour Exceedance Days 2000-2008

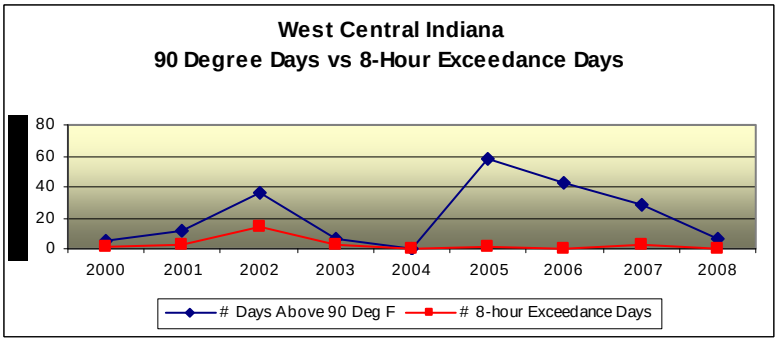
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Northwest Indiana	5	11	25	6	0	8	2	5	1
North Central Indiana	3	6	27	6	1	6	0	3	0
Northeast Indiana	4	3	14	4	0	8	0	1	0
Central Indiana	5	11	26	12	1	5	2	6	5
West Central Indiana	1	2	14	3	0	1	0	2	0
Southwest Indiana	8	6	21	6	0	4	2	12	5
Southeast Indiana	5	5	21	5	0	3	3	9	4

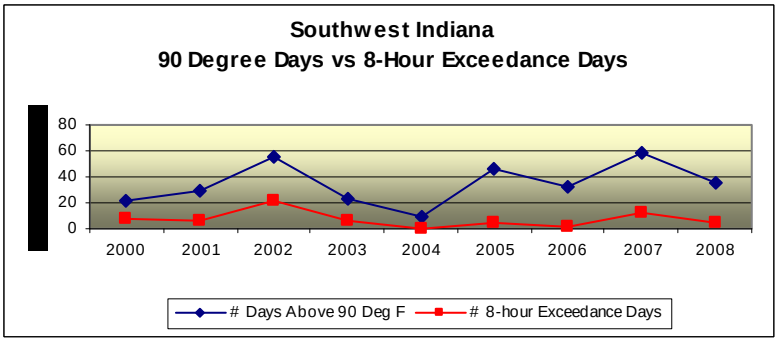


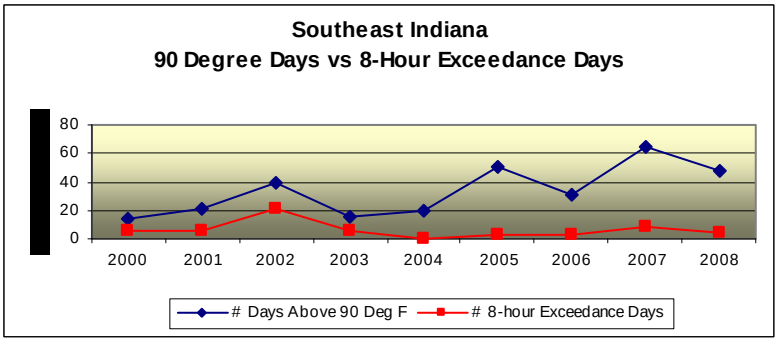












Ozone Monitors by Area of the State		
Area	**Counties**	
Northwest	Lake	LaPorte Porter
North Central	Elkhart	St. Joseph
Northeast	Allen	Huntington
Central	Boone Delaware Hamilton Hancock Hendricks	Johnson Madison Marion Morgan Shelby
West Central	Carroll	Vigo
Southwest	Greene Perry Posey	Vanderburgh Warrick
Southeast	Clark	Jackson Floyd

Maintenance Plan Trigger Evaluation

	08 4th High	07-08 Avg 4th High	06-08 Avg 4th High	Warning Trigger (W)	Action Trigger (A)	Response Needed
Central Indiana						
Fort Harrison	0.075	0.079	0.078	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Noblesville	0.073	0.079	0.078	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Fort Wayne						
Leo	0.069	0.075	0.073	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
South Bend/ Elkhart						
Granger	0.069	0.076	0.073	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Bristol	0.068	0.075	0.072	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Clark/Floyd						
Charlestown	0.075	0.083	0.081	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Evansville						
Inglefield	0.072	0.080	0.080	1Yr.@0.088	3 Yrs.@0.085	W-No A-No
Boonville	0.071	0.074	0.077	1Yr.@0.088	3 Yrs.@0.085	W-No A-No
Greene County						
Plummer	0.072	0.078	0.077	1Yr.@0.088	3 Yrs.@0.085	W-No A-No
Jackson County						
Brownstown	0.070	0.074	0.074	1Yr.@0.088	3 Yrs.@0.085	W-No A-No
LaPorte County						
LaPorte	0.065	0.072	0.070	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Michigan City	0.059	0.066	0.069	1 Yr.@0.089/2Yrs.@0.085	3 Yrs.@0.085	W-No A-No
Muncie						
Albany	0.062	0.071	0.071	1Yr.@0.088	3 Yrs.@0.085	W-No A-No
Terre Haute						
Sandcut	0.066	0.070	0.070	1Yr.@0.088	3 Yrs.@0.085	W-No A-No